Introduction

Sexual selection in female guppies (Poecilia reticulata) is contingent on female choice. Color and length of male guppies have been shown to be determinants for female choice (Hughes et al. 2013). We separated males into three color groups (bright, clear, and dark) and into short and long categories to test whether color or length is the major determinant for female choice in guppies.

We hypothesize that color will be more of a determining factor in female mate-choice as opposed to length. We predict that females will have a preference for clear males regardless of length.

Methods and Procedures

• Experiment conducted at USU in Logan, Utah inside the BNR room 206 on November 5, 7, 12, and 14, 2013 at 10:30 am.
• Tank size 7.5 L, 30x14.5x20cm dimensions, with a temperature of 21.1°C. Water height 10 cm.
• Tank was split into three equal sections (10 cm) with transparent glass barriers, with the middle section separated into three equal groups for right preference, neutral, and left preference.
• One male of each pair was placed on opposite sides of the female; female’s behavior was then observed for five minutes, with the males switching sides at two minutes and thirty seconds (controlling for side bias of female).
• Total time female spent in each section was recorded, as well as the number of times that the female touched the glass with face (nose nudges).
• Identified a trend in female preference for longer males (vs. short).
• To test color vs. length, we then used the most preferred color, clear against the least preferred color, dark.

Results

• A trend of female preference for clear males with spotted tails over bright or dark colored males was observed.

Figure 1. Total time female spent on specific colored male tank side. Three trials were run, each with three females. Dark vs. clear, dark vs. colored, and colored vs. clear males were directly tested against each other. A trend for female preference for clear males with spots was established.

Figure 6. Female preference for color vs. length based on number of nose nudges on respective glass divider. A trend of female preference for clear males with spots was established.

Figure 10. Total number of female nose nudges for specific males. This shows a trend in female preference with color as the major determinant of preference, seen by the short-clear male receiving higher totals than the long-dark male.

Discussion

• Females showed the highest preference for clear males and the least preference for dark males.
• Females also showed a trend for preferring longer males over shorter males.
• When cross-tested, females showed a trend for preferring color over length (short clear males chosen over long dark males).
• Paired t-tests confirmed the trend, with the short clear males having higher means for time (mean=142.67, SD=41, P=0.19, t=1.5601, df=8) than the long dark males’ means for time (mean=106.33, SD=39) and nudes (mean=21.56, SD=20).
• Further studies will need to be made to confirm that color is more of a determining factor in female mate-choice than length.

Figure 2. Test tank divisions.

Figure 3. Males color classifications.

Males classified into clear, dark, or bright; long (3.5+ cm) or short (<2.5 cm) categories.

• Tested three different females with contrasting male pairs; clear vs. dark, bright vs. dark, and clear vs. bright.

• One male of each pair was placed on opposite sides of the female; female’s behavior was then observed for five minutes, with the males switching sides at two minutes and thirty seconds (controlling for side bias of female).

• Total time female spent in each section was recorded, as well as the number of times that the female touched the glass with face (nose nudges).

• Identified a trend in female preference for longer males (vs. short).

• To test color vs. length, we then used the most preferred color, clear against the least preferred color, dark.

• Then tested long dark vs. short clear males for three trials; each trial consisted of three females and two males.

• A trend for female preference of long males (3.5+cm) over short males (<2.5cm) was observed by comparing female mate choice of a pair of males that were within the same color category but that had a size discrepancy between them.

Figure 4. Male length classifications.

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